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### REMARKS

Claims 1, 3-5, and 7-19 are pending in the application. Claims 14-19 are withdrawn from consideration. Claims 1, 3-5, and 7-13 are rejected under 35 USC § 103(a) as obvious over four separate combinations of prior art.

#### 1. Rejection under 35 USC § 103(a) based on Qiao in view of Datta

Claims 1, 3-5, 7-8, and 13 are rejected under 35 USC § 103(a) as obvious over Qiao (provisional application 60/483,956) in view of Datta (US 6,228,246B1) and Rosswag (US 4,372,831). A § 103(a) rejection is proper if the prior art references suggest to the skilled artisan that they can be combined and that this combination would have a reasonable probability of success. Because Applicants previously removed Qiao as a prior art reference by submitting 37 CFR 1.131 and 37 CFR 1.132 declarations, Applicants traverse the rejection.

On April 10, 2003 Applicants published "Continuous electropolishing of Halstelloy substrates for ion-beam assisted deposition of MgO" ("Publication") in Superconductor Science and Technology. Based on the Publication, Applicants submitted a 37 CFR 1.131 declaration establishing a date of conception prior to Qiao. Applicants concurrently submitted a 37 CFR 1.132 declaration stating that "the scope of the Publication . . . would be understood by those of ordinary skill in the art to be commensurate with the scope of the claims of the Application." 37 CFR 1.132 declaration, paragraph 4.

Despite this showing, the Examiner continues to argue (1) "the evidence provided is not commensurate with the scope of the invention" and (2) "the evidence submitted is insufficient to establish a conception of the invention." Office Action 11/21/2006, at 13 and 15. Specifically the Examiner argues (i) "the declaration does not provide evidence of conception for electropolishing metallic tape having an 'initial roughness of more than 10 nm," (ii) "the declaration does not provide evidence of conception for applying current densities of 'at least 0.18 A/cm<sup>2</sup>' and 'at least 0.37 A/cm<sup>2</sup>,'" and (iii) "the declaration does not provide evidence of conception for an anode that includes a metal selected from the group consisting of titanium, niobium, tantalum, platinum, rhenium,

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rhodium, nickel, chromium, gold and silver." Id. at 17-20. In sum, the Examiner argues the Publication must have an identical disclosure with the subject matter claimed.

The Examiner ignores MPEP 715.02 which only requires that "the differences between the claimed invention and the showing under 37 CFR 1.131 would have been obvious to one of ordinary skill in the art, in view of the applicant's 37 CFR 1.131 evidence, prior to the effective date of the reference or the activity." The Applicants' 37 CFR 1.131 and 37 CFR 1.132 evidence satisfies this burden because, as stated above, the 37 CFR 1.132 declaration provides that "the scope of the Publication . . . would be understood by those of ordinary skill in the art to be commensurate with the scope of the claims of the Application." 37 CFR 1.132 declaration, paragraphs 4-6. Thus, Applicants kindly request the rejection be withdrawn.

Claims 9-12 depend from claim 1. Claims 9 and 12 are rejected under 35 USC § 103(a) as obvious over Qiao in view of Datta and Rosswag further in view of Drummond (US 2,330,562). Claims 10 and 11 are rejected under 35 USC § 103(a) as obvious over Qiao in view of Datta and Rosswag further in view of Drummond and further in view of Tezuka (US 5,843,290). Because Qiao has been removed as prior art for claim 1, it is similarly removed as prior art for claims 9-12. Thus, Applicants kindly request the rejection be withdrawn.

## **2. Rejection under 35 USC § 103(a) based on Arendt '150**

Claims 1, 3-5, 7-8 and 13 are rejected under 35 USC § 103(a) as obvious over Arendt (US 2003/0144150A1). Arendt '150 has a common inventor with the instant application, and therefore Arendt '150 constitutes prior art only under 35 USC § 102(e). Because Applicants can disqualify Arendt '150 under 35 USC § 103(c), Applicants traverse the rejection.

Section 102(e) prior art can be disqualified if "the subject matter and the claimed invention were, at the time the claimed invention was made, owned by the same person or subject to an obligation of assignment to the same person." 35 USC § 103(c). All named inventors for Arendt '150 and the instant application were employees of the University of California ("UC") at the time the claimed invention was made and therefore

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subject to an obligation of assignment to UC. In support of this argument, Applicant submit herewith a copy of the assignment documentation for Arendt '150. Because Arendt '150 is disqualified under § 103(c), the § 103(a) rejection is improper. Thus, Applicants kindly request the rejection be withdrawn.

**3. Rejection under 35 USC § 103(a) based on Arendt '483 In view of Rosswag** Claims 1, 3-4, 7-8, and 13 are rejected under 35 USC § 103(a) as obvious over Arendt (US 2003/0036483A1) in view of Rosswag (US 4,372,831). A § 103(a) rejection is proper if the prior art references suggest to the skilled artisan that they can be combined and that this combination would have a reasonable probability of success. Because Arendt '483 in view of Rosswag does not teach or suggest the claimed invention, Applicants traverse the rejection.

As suggested by the Examiner during the April 12, 2007 interview, Applicants submit herewith a 37 CFR 1.132 declaration establishing that:

- a. Arendt 483 teaches an article comprising a substrate, a layer of an inert oxide material upon the surface of the substrate, a layer of an amorphous oxide or oxynitride material upon the inert oxide material layer, and a layer of an oriented cubic oxide material having a rock-salt-like structure upon the amorphous oxide or oxynitride material layer;
- b. Arendt '483 paragraphs [0015] and [0016] teach that a metallic substrate often has a RMS roughness of 15 nm to 100 nm or greater;
- c. Arendt '483 paragraphs [0015] and [0016] teach that the metallic substrate can be mechanically polished, electrochemically polished, or chemically polished to reduce the RMS roughness, but, even if polished, the inert oxide layer must be deposited to give the substrate a RMS roughness of less than 2 nm;
- d. one of ordinary skill in the art would not be able to attain a RMS roughness of less than about 2 nm by any electropolishing process disclosed in Arendt '483 without the inert oxide layer;
- e. at the time of Arendt '483 a process for electropolishing a metallic substrate to a RMS roughness of less than 2 nm was not known; and
- f. Rosswag does not satisfy the deficiencies of Arendt '483.

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Because the 37 CFR 1.132 declaration establishes that Arendt '483 in view of Rosswag does not teach or suggest a process for electropolishing a metallic tape to the claimed RMS roughness of 4 nm, the § 103(a) rejection is improper. Thus, Applicants kindly request the rejection be withdrawn.

**4. Rejection under 35 USC § 103(a) based on Glowacki in view of Rosswag**

Claims 1, 3-5, 7-8, and 13 were rejected under 35 USC § 103(a) as obvious over Glowacki (*Texture developments in long lengths of NiFe tapes for superconducting coated conductors*, J. of Materials Science, vol. 37, no 1, pp 157-168, Jan. 2002) in view of Rosswag (US 4,372,831). A § 103(a) rejection is proper if the prior art references suggest to the skilled artisan that they can be combined and that this combination would have a reasonable probability of success. Because Glowacki in view of Rosswag does not teach or suggest the claimed invention, Applicants traverse the rejection.

As suggested by the Examiner during the April 12, 2007 interview, Applicants submit herewith a Rule 1.132 declaration establishing that:

- a. "mirror gloss" is a subjective term and that a surface does not need to be smooth to the claimed RMS roughness of about 4 nm to be sufficiently specular to be a mirror finish;
- b. "mirror glass" can be discerned from a surface with a RMS roughness as high as 20 nm;
- c. contrary to the Examiner's statements, combining Glowacki's disclosure and Rosswag's statement that "a mirror gloss or shine is obtained in the upper current density range" would not suggest to one skilled in the art that the claimed RMS roughness in claim 1 of about 4 nm could be achieved;
- d. furthermore, combining Glowacki's disclosure and Rosswag's statement that "a mirror gloss or shine is obtained in the upper current density range" would not suggest to one skilled in the art that the claimed RMS roughness in claim 3 of about 0.5 nm could be achieved;
- e. Paul Arendt, an Applicant, is a coauthor of *Improvements of IBAD MgO Template Layers on Metallic Substrates for YBCO HTS Deposition* (IEEE

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Transactions of Applied Superconductivity, vol. 13, no. 2, June 2003; submitted herewith) ("Article");

- f. the Article discusses the relationship of critical current density and substrate RMS roughness;
- g. as shown in Figure 3, a dramatic increase in critical current density is observed with decreased substrate RMS roughness;
- h. in particular Figure 3 shows that a critical current density of less than  $0.2 \text{ MA/cm}^2$  corresponds to a substrate RMS roughness of about 4 nm whereas a critical current density greater than  $1.0 \text{ MA/cm}^2$  corresponds to a substrate RMS roughness of about 0.5 nm which indicates that a smoother substrate yields a significantly higher critical current density; and
- i. even though the Article involves a substrate with a coating layer, the same relationship between critical current density and substrate RMS roughness is observed for a 4 nm electropolished metallic tape and a 0.5 nm electropolished metallic tape.

Because the included 37 CFR 1.132 declaration establishes that Glowacki in view of Rosswag does not teach or suggest a process for electropolishing a metallic tape to a RMS roughness of less than about 4 nm, the § 103(a) rejection is improper. Thus, Applicants kindly request the rejection be withdrawn.

Claims 9-12 depend from claim 1. Claims 9 and 12 are rejected under 35 USC § 103(a) as obvious over Glowacki in view of Rosswag further in view of Drummond (US 2,330,562). Claims 10 and 11 are rejected under 35 USC § 103(a) as obvious over Glowacki in view of Rosswag further in view of Drummond and further in view of Tezuka (US 5,843,290). Because the prior art fails to render claim 1 obvious, it similarly fails to render claims 9-12 obvious. Thus, Applicants kindly request the rejection be withdrawn.

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The above remarks generally track the various titled sections of the November 21, 2006

Office Action.

Respectfully submitted,

Date: 5/2/2007

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Rev. 10/25/02

## ASSIGNMENT

DOE S-100,569

For good and valuable consideration, the receipt of which is hereby acknowledged, ASSIGNOR(S),

1. Paul N. Arendt
2. Stephen R. Foltyn
3. James R. Groves
4. Quanxi Jia

hereby sells, assigns and transfers to ASSIGNEE, The Regents of the University of California, a California Corporation, having its statewide administrative offices located at 1111 Franklin Street, Fifth Floor, Oakland, CA 94607-5200, and the successors, assigns and legal representatives of the ASSIGNEE all of its right, title and interest for the United States and its territorial possessions and in all foreign countries in and to, any and all improvements which are disclosed in the invention titled:

SUBSTRATE STRUCTURE FOR GROWTH OF HIGHLY ORIENTED AND/OR EPITAXIAL LAYERS THEREON

and which is found in

- (a) ☒ U.S. patent application executed on February 07, 2003, entitled as above and listing the above-named person(s) as inventor(s)
- (b) ☐ U.S. application Serial No. \_\_\_\_\_, filed on \_\_\_\_\_
- (c) ☐ U.S. Patent No. \_\_\_\_\_, issued \_\_\_\_\_
- (d) ☐ U.S. provisional application filed on \_\_\_\_\_, entitled as above and listing the above-named person(s) as inventor(s)

and any legal equivalent thereof in a foreign country, including the right to claim priority and, in and to, all Letters Patent to be obtained for said invention by the above application or any continuation, division, continuation-in-part, extension or substitute thereof, and any reissue, reexamination or extension of said Letters Patent and all rights under all International Conventions for the Protection of Industrial Property;

ASSIGNOR(S) hereby covenants that no assignment, sale, agreement or encumbrance has been or will be made or entered into which would conflict with this assignment;

ASSIGNOR(S) further covenants that ASSIGNEE will, upon its request, be provided promptly with all pertinent facts and documents relating to said invention and said Letters Patent and legal equivalents as may be known and accessible to ASSIGNOR and will testify as to the same in any interference, litigation, or proceeding relating thereto and will promptly execute and deliver to ASSIGNEE or its legal representative any and all papers, instruments or affidavits required to apply for, obtain, maintain, issue or enforce said application, said invention and said Letters Patent and said equivalents thereof which may be necessary or desirable to carry out the purposes thereof. An attorney of record is authorized and requested by the execution of this assignment to insert into this assignment the filing date and serial number of said application when officially known.

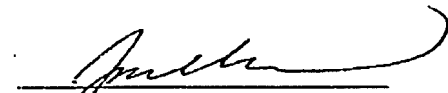

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AND the ASSIGNOR(S) requests the Commissioner of Patents and Trademarks to issue said Letters Patent of the United States and any reissue or extension thereof to the ASSIGNEE, The Regents of the University of California.

executed this

9<sup>TH</sup> day of FEB., 20037<sup>th</sup> day of February, 20037<sup>th</sup> day of Feb., 20037<sup>th</sup> day of Feb., 2003

Signature of Inventor(s)

  
Paul N. Arendt  
Stephen R. Foltyn  
James R. Groves  
Quanxi Jia